

Claims

What is claimed is:

- 5 1. A method for propagating information in a network having a plurality of routers and a plurality of circuit switches, the method comprising:
 - assigning an index number to an interface in a circuit switch in the plurality of circuit
 - 10 switches; and
 - transmitting the index number from a router to at least another router in the plurality of routers using a packet in accordance with a protocol used by the plurality of routers to
 - 15 communicate among each other.
2. The method of claim 1 wherein the protocol includes Open Shortest Path First (OSPF).
- 20 3. The method of claim 1 wherein the protocol includes Routing Information Protocol (RIP).
4. The method of claim 1 wherein a network element includes said circuit switch and said router,
- 25 said network element including a memory encoded with a table, the table including the index number.
5. The method of claim 4 wherein the table includes information indicating a function of a link
- 30 that couples the interface to another interface in another circuit switch.
6. The method of claim 1 wherein a network element includes said circuit switch and said router,

and wherein another circuit switch and said another router are included in another network element, the method further comprising:

5 said network element storing the index number
in a first table;

 said network element segmenting the packet
into a plurality of units;

 said network element forming a plurality of
frames equal in number to the plurality of units,
10 each frame including one unit in the plurality of
units;

 said another network element reassembling the
plurality of units into the packet; and

 said another network element storing the
15 index number in a second table.

7. The method of claim 6 wherein each unit in
the plurality of units is included in a header of a
frame in the plurality of frames.

20

8. The method of claim 7 wherein the plurality
of frames conform to a format selected from a group
consisting of Synchronous Optical Network (SONET) and
Synchronous Digital Hierarchy (SDH).

25

9. The method of claim 8 wherein each unit is in
a Data Communications Channel (DCC).

10. The method of claim 6 wherein each unit is
30 included in a payload of a frame in the plurality of
frames.

11. The method of claim 6 wherein the first table
and the second table both include information

indicating a predetermined number of contiguous frames that may be transmitted over a link that couples said interface to another interface in said another circuit switch.

5

12. The method of claim 6 wherein the first table and the second table both include information indicating a function of a link that couples said interface to another interface in said another circuit switch.

10

13. A method for propagating information in a network comprising:

automatically assigning a number to an
15 interface;
automatically transmitting said number on
said interface;
automatically transmitting said number on at
least one additional interface; and
20 wherein said interface and said one
additional interface are interfaces among a
plurality of interfaces in a circuit switch.

14. The method of claim 13 further comprising the
25 act of automatically transmitting said number on all
enabled interfaces in said circuit switch.

15. The method of claim 13 wherein said interface
and said one additional interface conform to a protocol
30 selected from a group consisting of Synchronous Optical
Network (SONET) and Synchronous Digital Hierarchy
(SDH).

16. The method of claim 13 further comprising:
storing said number in a first table in a
network element including said circuit switch; and
wherein at least another network element in
5 the network stores said number in a second table.

17. A network comprising:
a first circuit switch having a first
interface, the first interface having assigned
10 thereto a first identifier;
a second circuit switch having a second
interface, the second interface having assigned
thereto a second identifier;
a plurality of memory locations in said first
15 circuit switch containing a first table, the first
table including each of said first identifier and
said second identifier;
a plurality of memory locations in said
second circuit switch containing a second table,
20 the second table including each of said first
identifier and said second identifier; and
a link coupling said first interface to said
second interface.

25 18. The network of claim 17 wherein the link
includes a fiber optic cable.

19. The network of claim 17 wherein said first
circuit switch and said second circuit switch use a
30 protocol selected from a group consisting of
Synchronous Optical Network (SONET) and Synchronous
Digital Hierarchy (SDH).

20. The network of claim 17 wherein the first table and the second table both contain an entry indicating the function of said link.

5 21. The network of claim 17 wherein the first table and the second table both contain an entry indicating a predetermined number of contiguous frames that may be transmitted over said link.

10 22. A network element comprising:
 (a) a router;
 (b) a circuit switch; and
 (c) an interface, said interface generating
an output signal comprising:
15 (i) a first unit of information
uniquely identifying said interface from
among a plurality of interfaces in said
network element;
 (ii) a second unit of information
20 indicating a physical location of said
interface in said network element; and
 (iii) a third unit of information
indicating a physical address of said network
element.

25 23. The network element of claim 22 wherein said
output signal further comprises:
 a fourth unit of information indicating the
function of a link which couples said interface to
30 another interface in a circuit network.

24. The network element of claim 22 wherein said
output signal further comprises:

a fourth unit of information which indicates a predetermined number of contiguous frames that may be transported over a link which couples said interface to another interface in a circuit
5 network.

25. An article of manufacture comprising:
a computer readable medium containing a
computer readable program code for propagating
10 information in a network having a plurality of routers and a plurality of circuit switches, said computer readable program code in said article of manufacture comprising:

computer readable program code for assigning
15 an index number to an interface in a circuit switch in the plurality of circuit switches; and
computer readable program code for transmitting the index number from a router to at least another router in the plurality of routers
20 using a packet in accordance with a protocol used by the plurality of routers to communicate among each other.

26. The article of manufacture of claim 1 wherein
25 the protocol includes Open Shortest Path First (OSPF).

27. An article of manufacture comprising:
a computer readable medium containing a
computer readable program code for propagating
30 information in a network, said computer readable program code in said article of manufacture comprising:
computer readable program code for automatically assigning a number to an interface;

computer readable program code for
automatically transmitting said number on said
interface;

5 computer readable program code for
automatically transmitting said number on at least
one additional interface; and

wherein said interface and said one
additional interface are interfaces among a
plurality of interfaces in a circuit switch.

10